



LIQUID PENETRANT TEST REPORT

P- 08662

CLIENT Dart Aerospace DATE October 16, 2007 PAGE 1 OF 1
ATTENTION Bill Beckett ACUREN JOB NO. 188-07-01248 TIME AM ☐ PM ☒
ADDRESS 1270 Aberdeen Street PO/WO No. _____
HAWKESBURY, Ontario K6A 1K7 WORK LOCATION as shown
PROJECT Cross Tube inspection ACCEPTANCE STD. E1417-99 REV./DATE 99
ITEM(S) EXAMINED Inspection of High Aft X Tube 412, 206L AFT X-Tube and 206L
FWD X-Tube as listed below

JOB DESCRIPTION _____ PROCEDURE NO. E1417 REV./DATE 99 TECHNIQUE No. LT-XXXX-XXX REV./DATE _____
PART NO. D412664203, D206667203, D20666703 MATERIAL 7075 Aluminum THICKNESS < 1/2"
SCOPE 100% examination using Type I, Method A, Level 2 Penetrant examination
per Standard ASTM E1417-99

TEST DETAILS

METHOD ☒ FLUORESCENT ☐ VISIBLE ☒ WATER WASH ☐ SOLVENT REMOVABLE ☐ POST EMULSIFIER
FAMILY BRAND Magnaflux Batch # 07E046 BLACK LIGHT S/N 10645 ☒ OUTPUT > 1000 μ W/cm² ☒ AMBIENT < 2 fc
PENETRANT Z167 MINIMUM DWELL TIME 10 MIN. LIGHTING EQUIP. ☐ FLASHLIGHT ☐ TROUBLELIGHT ☐ OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER Water MINIMUM DRY TIME >10 MIN. OTHER _____
DEVELOPER NA MINIMUM DWELL TIME 10 MIN. LIGHT METER S/N _____ CAL DUE DATE _____
DEVELOPER TYPE NA ☒ NON AQUEOUS ☐ AQUEOUS ☐ DRY Black light Calibration Due March 4, 2008

TEST SURFACE

SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☐ MACHINED ☐ SHOT BLASTED ☒ CLEAN BARE METAL
SURFACE TEMPERATURE ☐ < -4°C/ 20°F ☐ -4°C/ 20°F TO 10°C/50°F ☒ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

ITEM	COMMENTS	ACCEPT	REJECT
4 pieces P.N. D206667103	Jb #'s, 34138, 34137, 33156, 34140		
1 piece P.N. D412664203	Jb # 33538		
1 piece P.N. D206667203	Jb # 34144		
All 6 pieces Acceptable			

Scope of Services

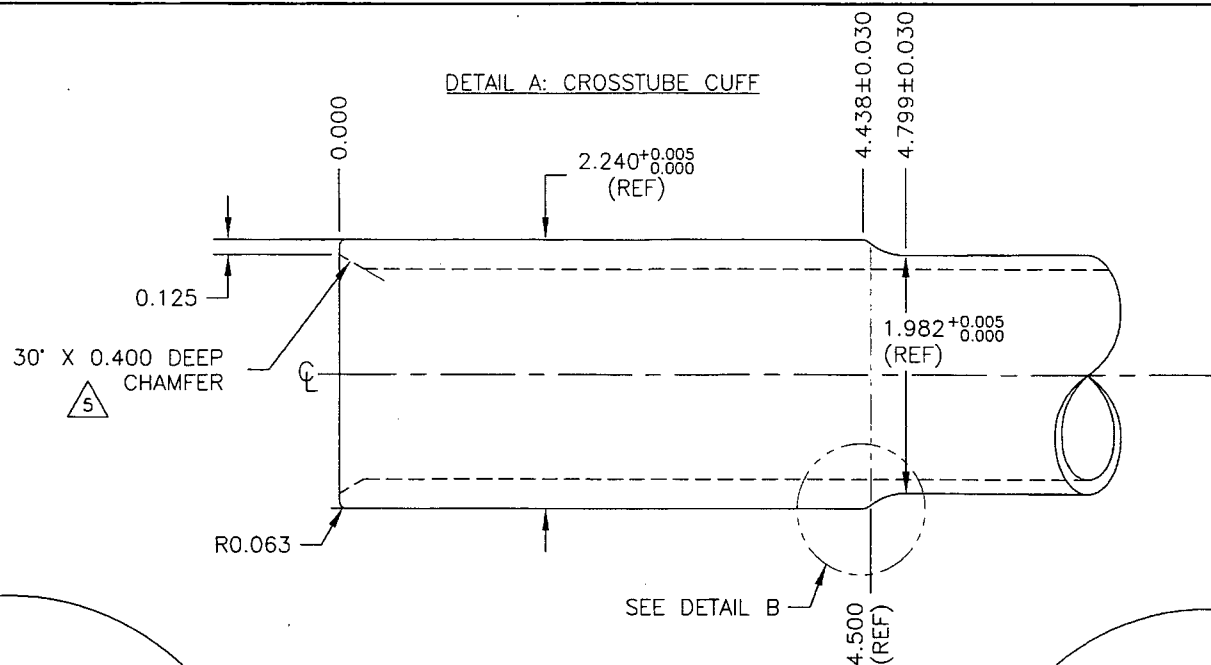
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE Jason Munklach DTR # 188-07-01248
TECHNICIAN (SIGNATURE): Mark Westover SIGNATURE
NAME (PRINT): Mark Westover REPORT REVIEWED BY: _____
1ST TECHNICIAN 2ND TECHNICIAN
CGSB LEVEL 2 SNT LEVEL 2 CGSB LEVEL _____ SNT LEVEL _____
CGSB REG. NO. 5323 CGSB REG. NO. _____



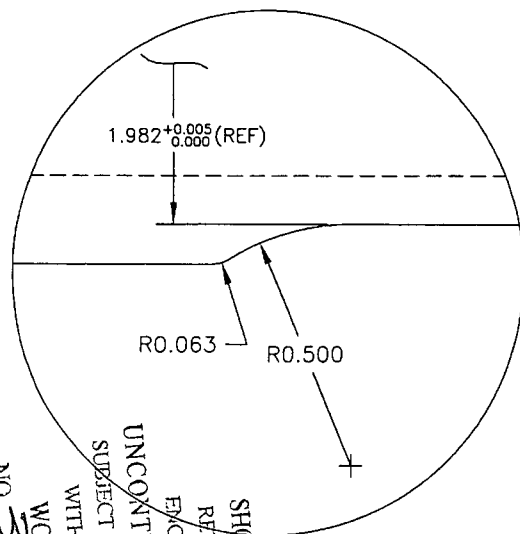
05.07.26 #

UNDER REVIEW

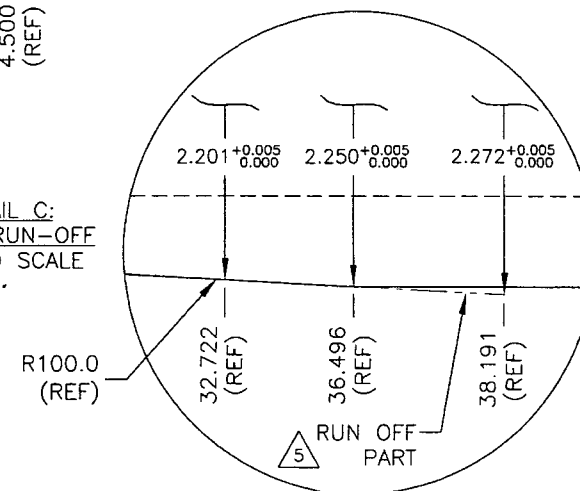
06.03.10 PH

Re-draw detail F

PH 07.05.02



DETAIL C:
TAPER RUN-OFF
NOT TO SCALE



NO 33156

WORK ORDER

WITHOUT NOTICE

UNCONTROLLED COPY

ENGINEERING

RETURN TO

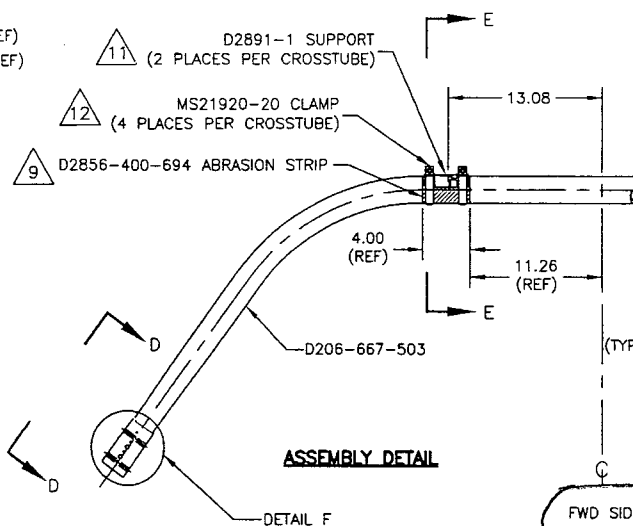
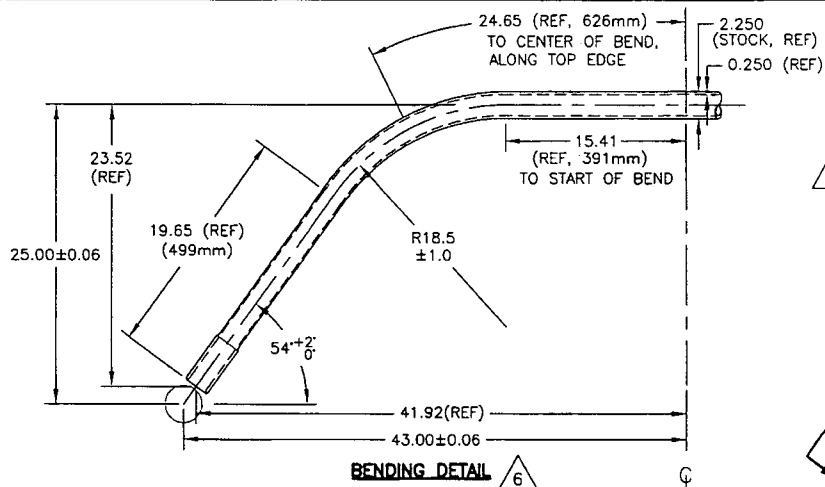
SHOP COPY

SUBJECT TO AMENDMENT

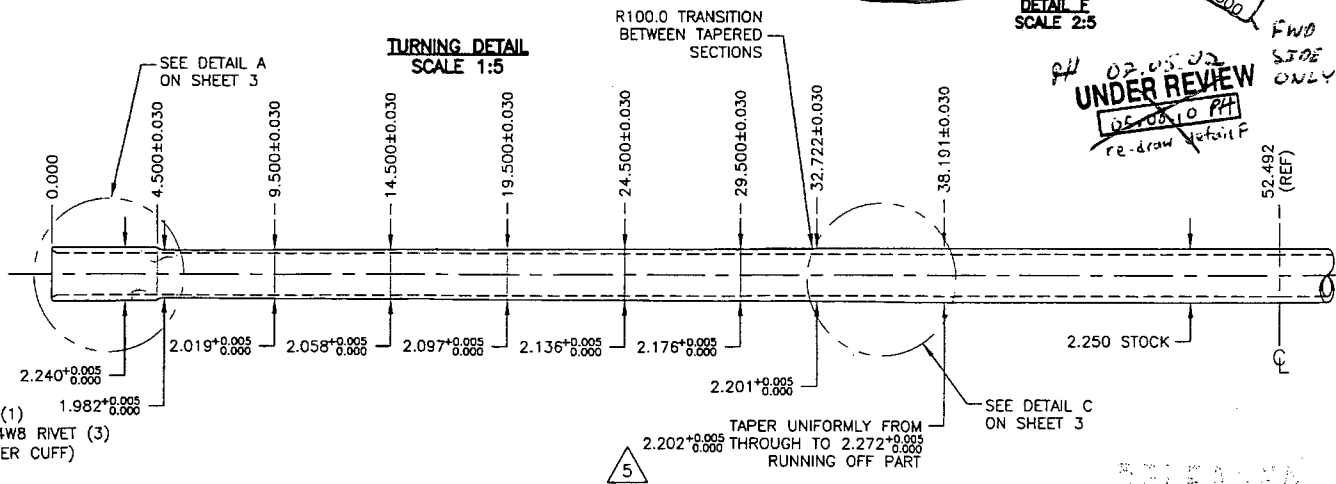
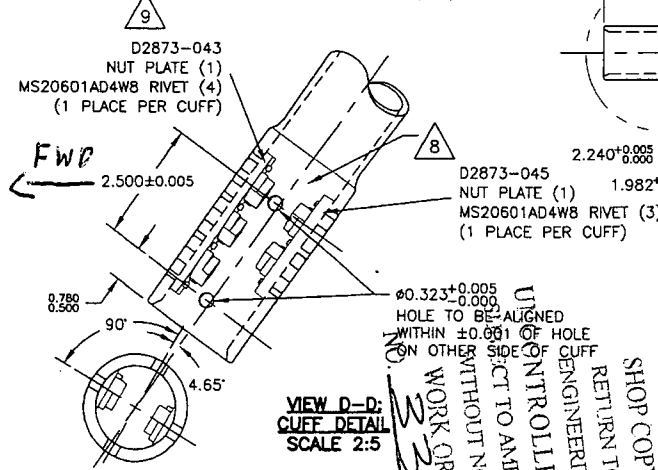
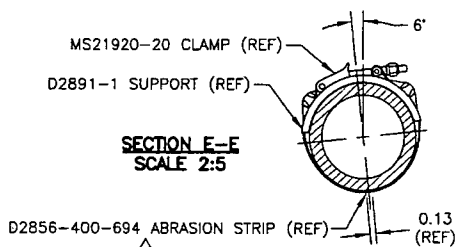
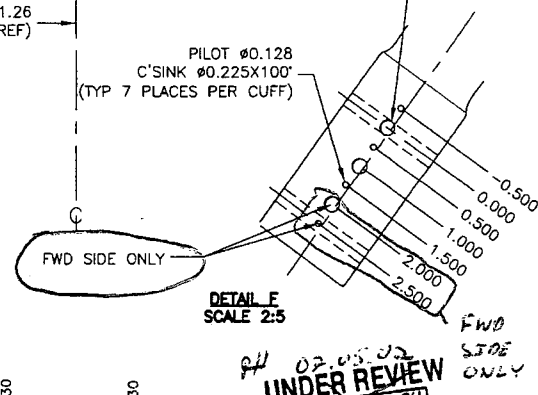
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DESIGN	PH	DRAWN BY	PH	DART	DART AEROSPACE LTD. HAMPSHIRE, ONTARIO, CANADA
CHECKED	PH	APPROVED	PH	DRAWING NO.	REV. B
DATE	05.07.26			D206-667-143	SHEET 3 OF 3
				TITLE	SCALE
				CROSSTUBE ASS'Y (206L HIGH FWD)	1:1



△ B $\phi 0.323^{+0.005}_{-0.000}$
(TYP 5 PLACES PER CUFF)
HOLE TO BE ALIGNED WITHIN ± 0.001
OF HOLE ON OTHER SIDE OF CUFF



PH 02.05.02
UNDER REVIEW
05.08.10 PH
re-draw Detail F

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RETURN TO
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SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
150

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CHECKED		PH	PH	DRAWING NO.	1:10
DATE		PH	PH	D206-667-143	
05.07.26		TAPER UNIFORMLY FROM 2.202 ± 0.005 THROUGH TO 2.272 ± 0.005 RUNNING OFF PART		TITLE	
				CROSSTUBE ASS'Y (206L HIGH FWD)	

Date: Tuesday, 6/26/2007 3:10:44 PM

User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L FWD X-TUBE

Job Number: 33156

Part Number: D206667103BL

Job Number:



Seq. #:

Machine Or Operation:

Description :

35.0

AN960JD516

Washer



Comment: Qty.: 18.0000 Each(s)/Unit Total : 18.0000 Each(s)

Pick: Packing Kit

Qty Part number Description Batch

18 AN960JD516 Washer *M104156*

7/10/22 SP

36.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

6 7/10/22

37.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D206-667-103

Location: _____

PPP Rev: _____

B

7/10/22

SP

38.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



U 8-10-23

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Tuesday, 6/26/2007 10:44 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L FWD X-TUBE

Job Number: 33156

Part Number: D206667103BL

Job Number:



Seq. #:

Machine Or Operation:

Description :

2-Install supports and clamps as per Dwg D4206-667-143. Torque clamps to 80-100 in lb

27 07-10-21

3-Install nut plates as per Dwg D206-667-143. Touch-up rivet heads with Imron paint.

27 07-10-16

29.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

6 07/10/22

30.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

31.0

AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Bolt

Batch: M104427

SD

32.0

MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Nut

Batch: M104812

SD

33.0

AN57A

Bolt



Comment: Qty.: 10.0000 Each(s)/Unit Total : 10.0000 Each(s)

Pick:Packing Kit

Qty Part number

10 AN5-7A

Description Batch

Bolt

M104885

SD 1
M105426, 104603

34.0

AN530A

BOLT



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:Packing Kit

Qty Part number

4 AN5-30A

Description Batch

Bolt

M103641

7/10/22 SD

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Tuesday, 6/26/2007 3:10:43 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L FWD X-TUBE

Job Number: 33156

Part Number: D206667103BL

Job Number:



Seq. #:

Machine Or Operation:

Description :

23.0

D2873043

Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2873-043

Nut Plate

33422

BT 07-10-16

24.0

D2873045

Nut Plate Assembly



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2873-045

Nut Plate

33692

BT 07-10-16

25.0

D28911

Support 2.25 dia



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2891-1

Support

34147

BT 07-10-21

26.0

MS20601AD4W8

RIVET



Comment: Qty.: 14.0000 Each(s)/Unit Total : 14.0000 Each(s)

Pick:

Qty Part number Description Batch

14 MS20601AD4W8 Rivet

105057

BT 07-10-16

27.0

MS2192020

Clamp (per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:

Qty Part number Description Batch

4 MS21920-20

Clamp

104423

BT 07-10-21

28.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install abrasion strips as per QSI 035 using DT8579. .Note: (2) Aft holes should be facing up.

BT 07-10-21

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Tuesday, 6/26/2007 3:10:43 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L FWD X-TUBE

Job Number: 33156

Part Number: D206667103BL

Job Number:



Seq. #:

Machine Or Operation:

Description :

17.0

OUTSIDE SERV.10

OUTSIDE SERVICES -LG



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 038Or

Issue P/O: 4812 LPI as per ASTM 1417

Level 2 Attach copy of NDT results to work order

C 207/11/16 (1)

18.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage

Ensure copy of NDT results attached to work order.

C 207/11/16 (1)

19.0

QC6

DIMENSIONAL CHECK



Comment: Inspect for damage & ensure results are as per Dwg D206-667-103

En 2/10/16

20.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube DELFLEET BLUE

3-CLEAR WITH DELFLEET

ISSUE P.O TO ATELIER DEBOSSSELAGE

→ PT 07-10-16

ml 07 10 19 (1)

21.0

QC14

INSPECT SPRAY PAINT



Comment: Inspect Spray Paint

Wrap in plastic bag to protect from scratches

PT 07 10 21

22.0

D2856400

Abrasion Strip



Comment: Qty.: 1.2138 f(s)/Unit Total : 1.2138 f(s)

Pick:

Qty Part number Description Batch

2 D2856-400(Cut to 6.94") Abrasion Strip 34293

PT 07-10-21

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Tuesday, 6/26/2007 3:10:43 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L FWD X-TUBE

Job Number: 33156

Part Number: D206667103BL

Job Number:



Seq. #:

Machine Or Operation:

Description :

12.0

QC15

DIMENSIONAL CHECK OF X-TUBES



Comment: DIMENSIONAL CHECK OF X-TUBES

7-10-10 (1)

13.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill pilot holes in tube using drill Jig DT8541 & DT8542 as per Dwg D206-667-143. Drill all (3) top holes

2-Drill and Ream all holes in tube to finish size using drill Jig DT8541 & DT8542 as per Dwg D206-667-143 Check dimensions between holes on all four sides.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

4-Drill pilot holes using drill Jig DT8541 & DT8542 as per Dwg D206-667-143. Drill only the top (2) holes.

5-Drill & ream the top (2) holes to finish size using drill Jig DT8541 & DT8542 as per Dwg D206-667-143

6-Drill Fwd rivet holes using drill Jig DT8787FWD as per Dwg D206-667-143. Note: Fwd side has 3x top holes.

7-Drill Aft rivet holes using drill Jig DT8787AFT as per Dwg D206-667-143.

8-C'sink holes as per Dwg D206-667-143. Allow rivet to sit below surface to compensate for paint.

9-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D206-667-143

7-10-10

JD 7-10-11

14.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

Jb 7-10-12

15.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

7-10-12 (1)

16.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

7-10-12 (1)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Tuesday, 6/26/2007 3:10:43 PM

User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 206L FWD X-TUBE

Job Number: 33156

Part Number: D206667103BL

Job Number:



Seq. #

Machine Or Operation:

Description :

5.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

1-Turn second side as per Folio FA087

2-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D206-667-143.

3-Remove sand and plugs

4-Scribe part # and batch # using vibrating stylus as per Dwg D206-667-143

Inside of Cuff(Donot engrave on outside of tube)

JF 07/07/28

6.0

QC1

INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

JF 07/07/28

7.0

QC8

SECOND CHECK



Comment: SECOND CHECK

J.F. 07/07/29 (1)

8.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

7-9-17
JK 7-7-30

1-Polish entire outside surface of crosstube

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

En 07/07/29 (1)

10.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

DP

7-9-18

11.0

BENDING

BENDING MACHINE



Comment: BENDING MACHINE

Bend tube as per Dwg D206-667-143 using CNC bender program 206L-fw and Folio FT017

EL 7-10-10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D206-667-003 PAR #: NA Fault Category: Prod / Machine NCR: Yes No DQA: 12 Date: 07/10/23
 QA: N/C Closed: 10 Date: 07.10.24

NCR: <u>3356</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
<u>07/07/24</u>	<u>3.0</u>	The coffee was machined too short 4.437" bad zero machined. do the zero machined return and the next one was ok.	<u>Posi</u>	OFF A PART IS TO SUB. NOT SURE WHY NC Reported.	<u>S.B</u> <u>07/07/24</u>	<u>070809</u>	<u>07.08.08</u>	<u>070808</u>
<u>070915</u>	<u>3.0</u>	The cuff was machined way to small on the wiffing pass. Cuff O.D. @ the top is 2.147 instead of 2.240. R.C. in the morning	<u>11</u>	Scrap & replace. <u>B 29113</u> Destroy. Rest of tube is no good.	<u>S.B</u> <u>07/09/10</u>	<u>07/09/07</u>	<u>07.09.07</u>	<u>070808</u>

NOTE: Date & initial all entries

31

Date: Tuesday, 6/26/2007 3:10:43 PM
User: Kim Johnston

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services Drawing Name : 206L FWD X-TUBE
 Job Number : 33156
 Estimate Number : 10553
 P.O. Number : N/A Part Number : D206667103BL
 This Issue : 6/26/2007 S.O. No. : N/A Drawing Number : D206-667-143 REV B
 Prsht Rev. : NC Project Number : N/A
 First Issue : N/A Type : LANDING GEAR Drawing Revision : B
 Previous Run : 33155 Material : N/A
 Due Date : 7/30/2007 Qty: 1 Um: Each
 Written By :
 Checked & Approved By : JD 07.06.27
 Comment : Est Rev:F 05.09.01 Add holes for compatibility with Bell
 Skid tubes KJ/JLM

Additional Product

Job Number:



Seq. #: Machine Or Operation: Description :

1.0 DC DOCUMENT CONTROL



KS 07.07.26

Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D206-667-103 CHG002

E 07/10/22

2.0 D6002115 Crosstube material



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part number Description Batch

1 D6002-115 Crosstube B029/13

Check OD = 2.250"; ID = 1.750"

D10

2

SF 07/07/15

3.0 MORI SEIKI MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA087

2-Turn first side as per Folio FA087

3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D206-667-143.

SF 07/07/15

4.0 QC1 INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

SF 07/07/15